

WHAT IS CLAIMED IS:

1. A method of targeting transient gene expression and stable gene expression in somatic cell tissue by exogenously administering a plasmid expression vector to differentiated somatic cell tissue selected from the group consisting of skin, muscle, fat and mammary tissue of living organisms, through a jet injector technique, wherein said plasmid expression vector is expressed in a living organism.

2. A method according to claim 1 further involving the steps of a member selected from the group consisting of (a) ablation of malignant cells, (b) ablation of cells infected with specific viruses, (c) gene therapy, (d) immunization, (e) generation of transgenic organisms, (f) converting secretory cells of living organisms into bio-reactors for producing a protein, (g) modifying the expression of endogenous gene, (h) providing a means for studying the effects of specific proteins in differentiated and undifferentiated tissue, (i) generating an animal model system for human diseases, and (j) inducing wound healing via the production of specific growth factor genes.

3. A method according to claim 2 wherein the secretory cells of the living organism are mammary or bladder cells.

4. A method according to claim 1 wherein said plasmid expression vector comprises DNA sequences selected from the group consisting of a DNA sequence claiming enhancer/promotor and other regulatory elements, a DNA sequence which can be transcribed into an RNA which RNA can be (a) translated into a protein, (b) includes a transcriptional termination signal, and (c) may include coding sequences for a signal peptide which allows a protein to be exported from the cell, a DNA sequence which targets a gene for incorporation into the genome, a DNA sequence which directly replicates in eukaryotic cells, and a plasmid sequence which allows DNA replication in prokaryotic cells.

5. A method according to claim 4 wherein said DNA sequence is constructed using enhancer/promoter components, termination signals, and signal peptide coating.

sequences from different genes which are combined to directly express in a specific manner.

6. A method according to claim 2 wherein the enhancer/promoter sequence is a naturally occurring element such as the HCMVIE1 promoter/enhancer, or the enhancer/promoter sequences constructed using specific DNA elements which mediate binding by specific transcription factors to directly express only in specific cell types.

7. A method according to claim 4 wherein the enhancer/promoter is composed of a generic TATA box and binding sites for the E2 transcription factor and said enhancer/promoter is coded by the papillomavirus genome, wherein said enhancer/promoter is expressed in cells capable of expressing the E2 protein from papillomavirus.

8. The method of claim 1, wherein said differentiated tissue is selected from the group consisting of muscle, fat and mammary tissue.

9. The method of claim 1, wherein said plasmid expression vector comprises a promoter-enhancer sequence selected from the group consisting of human cytomegalovirus immediate early gene 1 and whey acidic protein promoter sequence.

10. The method of claim 1, wherein said plasmid expression vector comprises a hybrid gene selected from the group consisting of human cytomegalovirus immediate early gene 1 and chloramphenicol acetyl transferase gene; whey acidic protein promoter sequence and chloramphenicol acetyl transferase gene; and human cytomegalovirus, immediate early gene 1 and β -galactosidase gene.

11. The method of claim 1, wherein said plasmid expression vector is expressed in a living organism at about 1 to about 3 cm. Distant from the site of injection.

12. The method of claim 1, wherein said plasmid expression vector comprises supercoiled DNA fragments of 1 microgram/microliter in 1 mM TRIS - .1 mM EDTA and is administered in volumes between 100 microliters and 500 microliters per injection.

13. An apparatus for jet injection of DNA into cell tissue, comprising:

- (a) at least one injection nozzle having at least one injection port;
- (b) injection tubing connecting said injecting nozzle to a jet propulsion system affixed to a platform for positioning said injection nozzle;
- (c) computer means electrically connected to said platform, wherein said computer means is adapted to provide movement to said platform to position said injection nozzle on the surface of the tissue to be injected.

14. An apparatus for jet injection according to claim 8, wherein said injection port is located at the end of said injection nozzle.

15. An apparatus for jet injection according to claim 8, wherein said injection port is located on the side of said injection nozzle.

16. An apparatus for jet injection according to claim 8, wherein said platform comprises a stationary platform connected to a moveable platform.

17. An apparatus for jet injection according to claim 8, further comprising an endoscopic device running parallel to said injection tubing, wherein said endoscopic device is controlled by an endoscopic control.

18. An apparatus for jet injection according to claim 8, said apparatus is adapted for injection of DNA into the human female cervix.

19. A method of targeting transient gene expression and stable gene expression in mammary tissue by exogenously administering a plasmid expression

vector, to mammary tissue of living organisms, through a jet injector technique, wherein said plasmid expression vector is expressed in a living organism.

20. A method according to claim 1, wherein said living organism is immunized by said plasmid expression vector which is expressed in said living organism.

21. A method of immunization comprising the steps of jet injecting an effective amount of a plasmid expression vector, to transform differentiated somatic cell tissue of living organisms selected from the group consisting of skin, muscle, fat and mammary tissue, wherein said plasmid expression vector is expressed in a living organism, and wherein DNA expressed from said plasmid expression vector immunizes said living organism.

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